

Addendum No. 1 to Pre-Remediation Implementation Work Plan

**Boeing Realty Corporation
Former C-6 Facility
19503 South Normandie Avenue
Los Angeles, California**

December 4, 2006

Prepared for:

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The information contained in the document titled "Addendum No. 1 to Pre-Remediation Implementation Work Plan" for site "Former C-6 Facility, Los Angeles, California", dated December 4, 2006 has received appropriate technical review and approval. The conclusions and recommendations presented represent professional judgments and are based upon findings from the investigations and sampling identified in the report and the interpretation of such data based on our experience and background. This acknowledgement is made in lieu of all warranties, either expressed or implied.

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Addendum No. 1 to Pre-Remediation Implementation Work Plan

1.0 Introduction

This addendum has been prepared to document deviations to the Pre-Remediation Implementation Work Plan (Work Plan, CDM, August 7, 2006) previously prepared for implementing pre-remediation activities at the Boeing Realty Corporation's (BRC) Former C-6 Facility (Site) in Los Angeles, California (Figure 1). This addendum provides modifications to Sections 2 (Pre-Field Activities) and 4.1 (Well Installation and Development Procedures) of the Work Plan. The specific modifications include:

- Two extraction wells (one B-Sand and one C-sand) are proposed in the northern parcel (Lot 8 or Former Building 1/36) as shown on Figure 1, instead of the one well (B-Sand only) originally proposed in the Work Plan. In addition, no aquifer testing is planned for Former Building 1/36 as adequate historical data appear to be present. We anticipate that these changes will facilitate the future implementation of groundwater remediation at the parcel.
- Two injection wells are proposed in the southern parcel (Sunrider property or Former Building 2) as shown on Figure 2 in order to replace/augment the existing injection infrastructure due to concerns regarding the effectiveness of the existing infrastructure. In addition, one observation well is also proposed (Figure 2) to allow for groundwater monitoring during the C-Sand aquifer testing.

2.0 Objectives

The specific objectives of these wells are to:

- Facilitate C-Sand aquifer testing in the southern parcel (Former Building 2) to determine aquifer hydraulic characteristics, assess leakage between the three-aquifer zones (B-Sand and C-sand, C-sand and Gage Aquifer) and utilize the Site data to update and refine the existing reconnaissance level groundwater flow and transport model.
- Allow for operation of small-/pilot-scale remediation systems at the Site (Former Building 1/36 and C-Sand in Former Building 2) to evaluate proof of concept and collect data for full-scale system design and implementation and/or expansion of the treatment areas and infrastructure in one or more phases.
- Allow for collection of soil samples for use in treatability testing, as described in Section 5 of the Work Plan and modified in this addendum.

Table 1 provides the proposed construction details of the extraction, injection, and observation wells.

Table 1
Summary of Well Details

Well	Proposed Diameter	Proposed Depth	Proposed Drilling Method
Former Building 1/36			
1 – B-Sand extraction well – EWB001	6-inch	Approximately 50 to 90 feet below ground surface (ft. bgs)	Sonic Drilling
1 – C-Sand extraction well – EWC001	4-inch	Approximately 120 feet bgs	Sonic Drilling
Former Building 2 – C-Sand			
1 – C-Sand extraction well – EWC002	4-inch	Approximately 130 feet bgs	Sonic Drilling
2 – C-Sand Injection wells – IWC001 and IWC002	4-inch	Approximately 130 feet bgs	
1 – C-Sand monitoring/ observation well- MWC024	4-inch	Approximately 130 feet bgs	

3.0 Well Location Selection Rationale

3.1 Former Building 1/36 Property

Review of previous data revealed that some slug tests and aquifer testing has been previously performed in few Former Building 1/36 B-Sand wells (Woodward-Clyde, March 1990, and Kennedy/Jenks Consultants, October 2000). A brief review of the available drawdown curves showed probable leaky conditions, since water levels stabilized after about 500 minutes of pumping. Analysis of these test as a fully confined system using the Cooper-Jacob approximation to the Theis solution, as was documented in the reports, will not yield representative estimates of hydraulic properties. The aquifer thickness that was used in the calculation of hydraulic conductivity is also likely not appropriate, since these wells may be located in the area of a “window” where the confining aquitard (Middle Bellflower Mud) between the B-Sand and the C-Sand units appears to be absent (Rubicon cross-sections, August 2006). This appears to be the case underneath most of Former Building 1/36. However, as part of the groundwater modeling, CDM will re-analyze the previous

test data conducted in Former Building 1/36 using appropriate methods to obtain the appropriate hydraulic conductivity values for the combined zone. As a result, CDM does not feel it is necessary to conduct further aquifer testing in Former Building 1/36.

Based on the above information, two extraction wells (one B-Sand – EWB001 and one C-sand – EWC001) are proposed as shown on Figures 1 and 2 with the primary purpose of operating a pilot-scale system. These locations can be used as part of overall preferred remedial approach for the site as determined by preliminary modeling. Even though the interpreted presence of the “window” between B-and C-Sand would warrant a single extraction well to address the combined B- and C-Sand unit, it is recommended to install two wells to address the unit as previous investigations have revealed significant change in concentrations over relatively short depth intervals.

The existing amendment wells in Former Building 1/36 which are outside the building footprint are planned to be used as injection wells, with no new injection wells proposed at this time. The number of amendment wells planned to be used for the pilot scale operation will be determined as part of the design phase of the pilot-scale system.

3.2 Former Building 2 Property

No extraction and injections wells or pilot systems are planned for the B-Sand unit in Former Building 2 at this time.

A total of two injection wells (IWC001 and IWC002), one extraction well (EWC002), and one observation well (MWC024) is proposed to address the C-Sand unit as shown on Figures 2 and 4. These are listed below:

- One C-Sand extraction well (EWC002) will be placed near the locations of wells MWG004 and MWB014. This location was chosen for the following reasons:
 - This is the only location which has B-Sand and Gage wells in close proximity that can serve as observation wells during the aquifer testing;
 - This well can be used as part of overall preferred remedial approach for the C-Sand as determined by preliminary modeling; and
 - This location is also within the area of the highest VOC impacts to the C-Sand (defined as being within the 1000 micrograms per liter [$\mu\text{g/L}$]).
- Two C-Sand injection wells (IWC001 and IWC002) will be placed as shown on Figures 2 and 4. These locations were chosen for the following reasons:
 - These locations are in the area of the highest VOC impacts to the C-Sand as defined above;

- These wells are located so that potential electron donors have as long a residence time in the subsurface as possible before reaching the extraction well and yet be within the flow field of the extraction well; and
 - These wells can be used as part of overall preferred remedial approach for the C-Sand as determined by preliminary modeling.
- Based on the recent slug tests conducted by Tait Environmental Management (TEM) in the C-Sand unit (CDM, September 6, 2006), one C-Sand monitoring/observation well is planned near wells MWG004 and MWB014 and the proposed C-Sand extraction well to serve as an observation well during the aquifer testing of the C-Sand well.

4.0 Modifications to Field Procedures

All well installation activities will be conducted in accordance with Haley & Aldrich's (H&A's) May 9, 2006 *Request for Proposal, Installation of Two Groundwater Extraction Wells, Former C-6 Facility, Los Angeles* (RFP) and CDM's Addendum No. 1 to the RFP (CDM, September 25, 2006).

4.1 Pre-Field Activities

In addition to the pre-field activities mentioned in Section 2.0 of the Work Plan, the following activities will be performed:

- Three locations (triangular) around each of the proposed well locations will be hand augered to a depth of 10 ft. bgs for further utility clearance.

4.2 Well Installation and Treatability Sample Collection

The following clarifications and additions are provided to Section 2.1 of the Work Plan:

- All casing and screen material is Schedule 80 PVC.
- Soil samples for electron donor treatability testing are proposed to be collected from any one of the C-Sand wells in Former Building 2. Groundwater samples for treatability testing are planned to be collected from Well IRZCMW003 which had the highest TCE concentration in C-Sand during the March 2006 sampling event. Appendix A provides the detailed procedures for collecting the treatability samples.

All other procedures outlined in the Work Plan will remain the same.

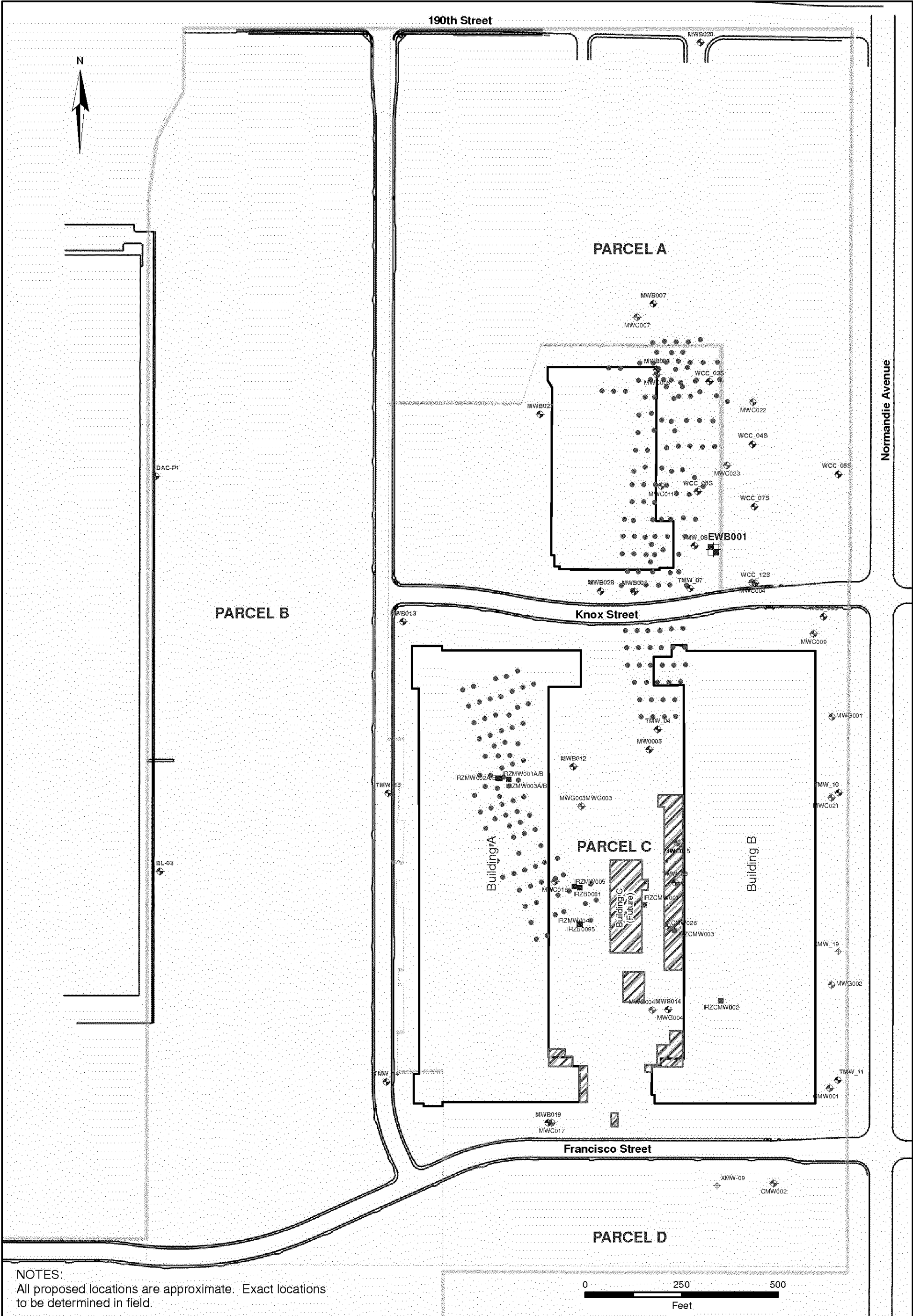
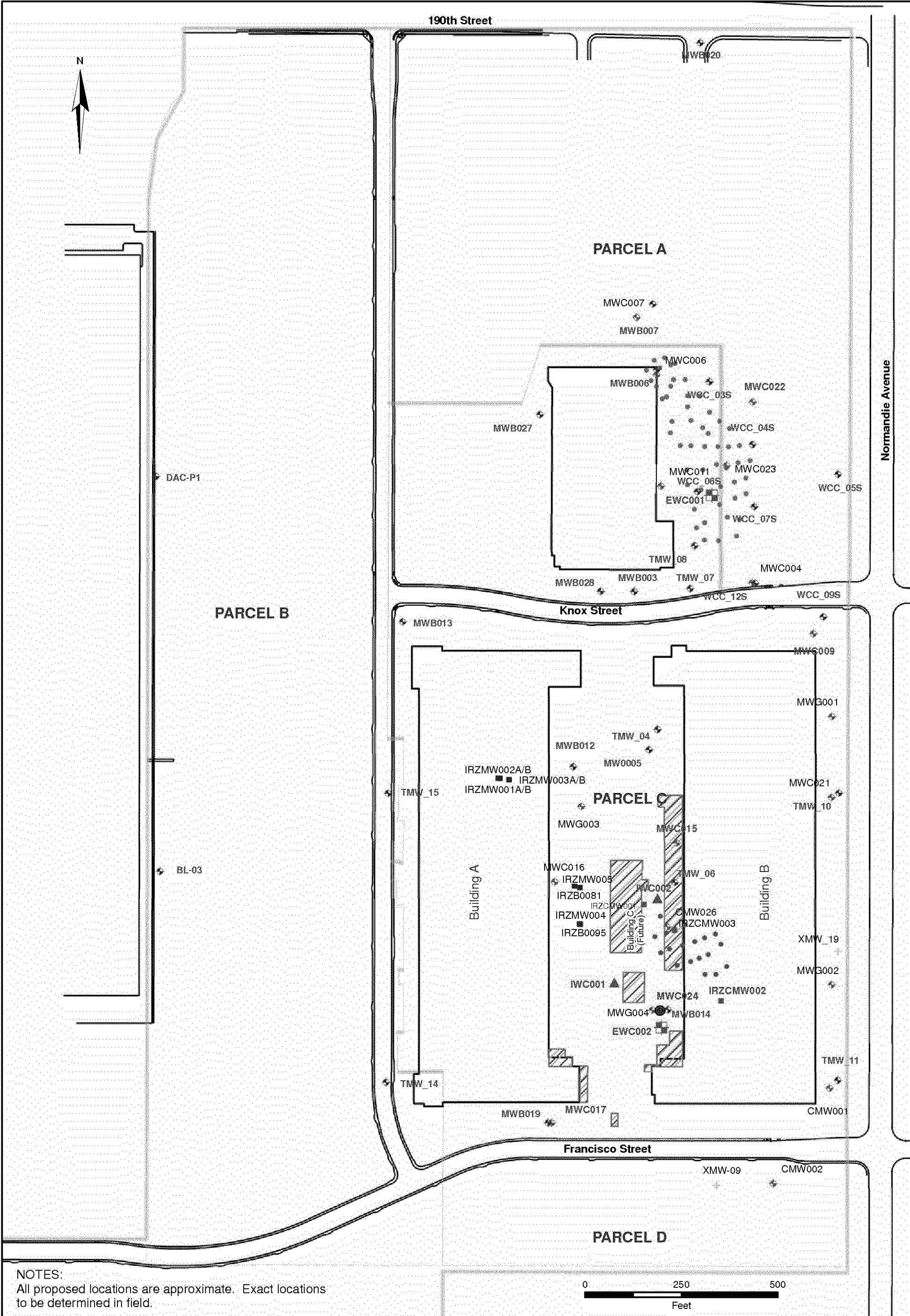


Figure 1
Boeing Realty Corporation
Former C-6 Facility
Proposed B-Sand
Extraction Well



Legend

Property Boundary	B-Sand IRZ Bioremediation Monitoring Well
Parcel Boundary	C-Sand IRZ Bioremediation Monitoring Well
Future Site Improvements (Approximate Area)	Amendment Wells (C-Sand)
Monitoring Wells	Proposed Wells
B-Sand Monitoring Well	C-Sand Extraction Well
C-Sand Monitoring Well	C-Sand Injection Well
Gage Monitoring Well	C-Sand Observation Well
Montrose Monitoring Well (B-Sand)	

Figure 2
Boeing Realty Corporation
Former C-6 Facility
Proposed C-Sand
Extraction and Injection Wells

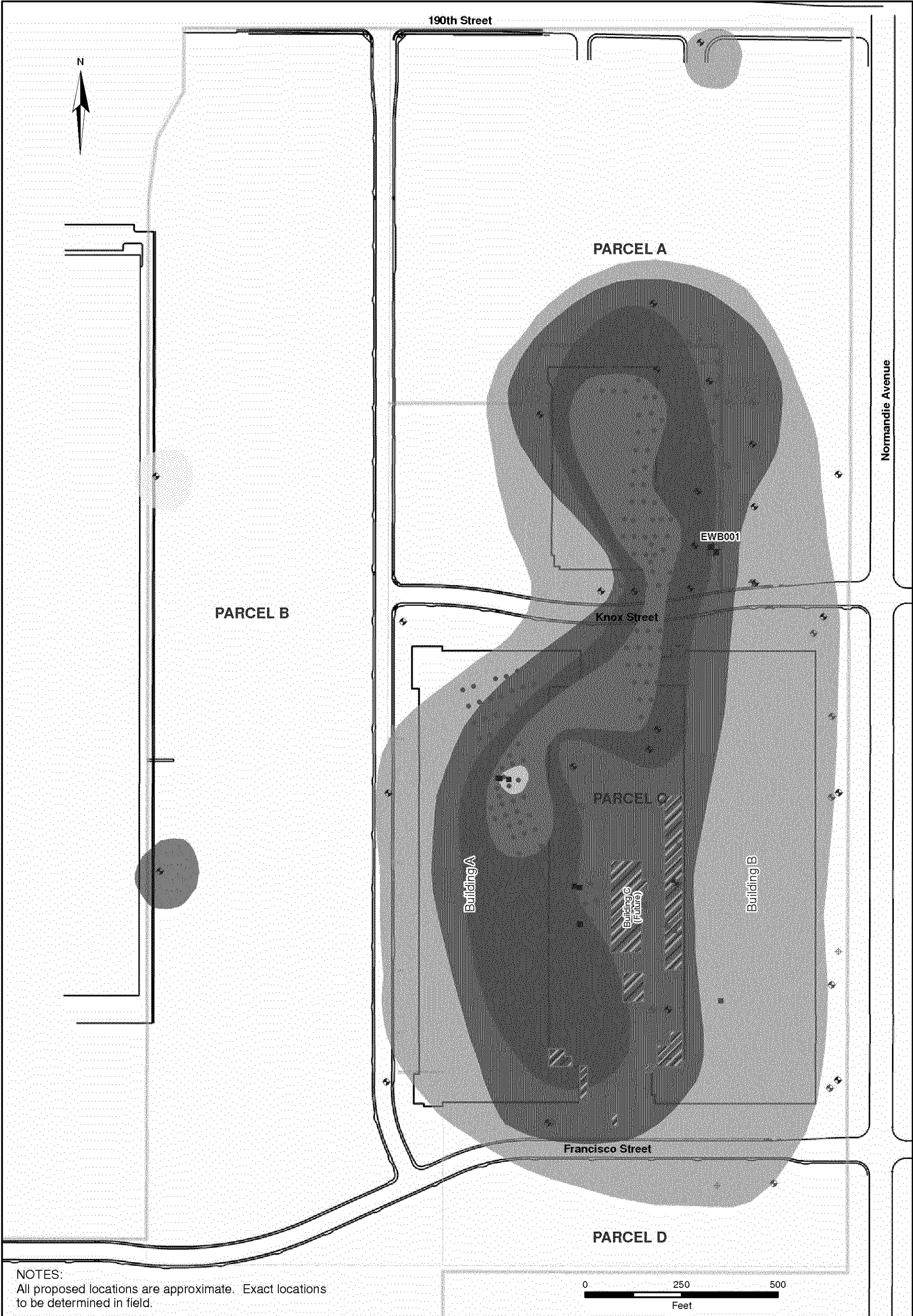
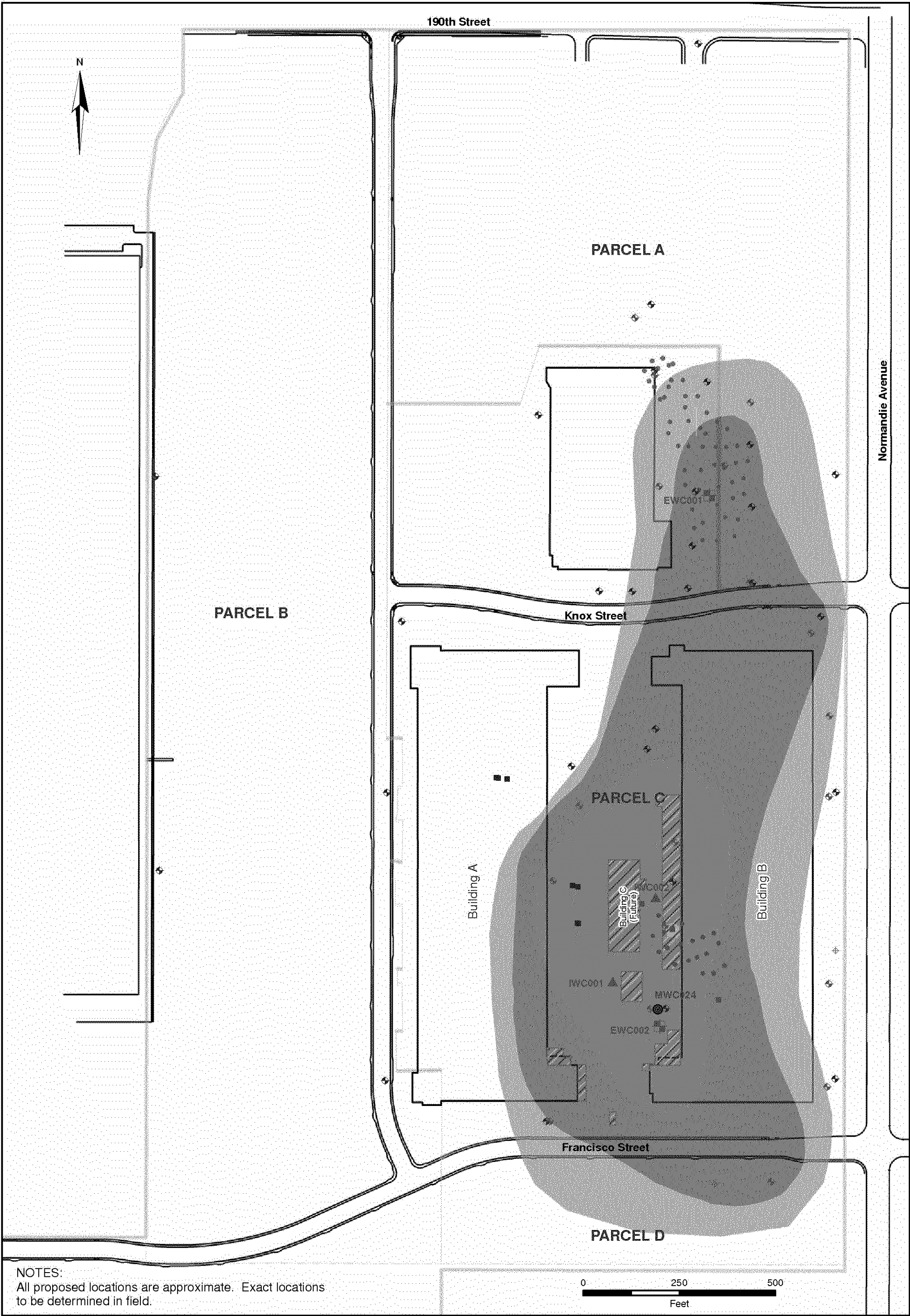


Figure 3
Boeing Realty Corporation
Former C-6 Facility
Proposed B-Sand
Extraction Well with March 2006
TCE Isoconcentration Contours





Legend

	Property Boundary		B-Sand Monitoring Well		C-Sand Extraction Well
	Parcel Boundary		C-Sand Monitoring Well		C-Sand Injection Well
	Future Site Improvements (Approximate Area) 10' (ppb)		Gage Monitoring Well		C-Sand Observation Well
	100 (ppb)		Montrose Monitoring Well (B-Sand)		
	1,000 (ppb)		B-Sand IRZ Bioremediation Monitoring Well		
	5,000 (ppb)		C-Sand IRZ Bioremediation Monitoring Well		
	10,000 (ppb)		Amendment Wells (C-Sand)		

Figure 4
Boeing Realty Corporation
Former C-6 Facility
Proposed C-Sand
Extraction and Injection Wells with
March 2006 TCE Isoconcentration Contours

Appendix A

Treatability Sample Collection Procedures

Former C-6 Facility
Soil and Groundwater Treatability Sample Collection
October 17, 2006

Groundwater samples

Groundwater samples will be collected from Well IRZCMW003 in pre-cleaned 1-L HDPE or glass bottles with no headspace. For the lab studies, 9 liters (L) of water are required. An additional 2 to 4 L will be collected for re-saturating the soil cores to be collected as described below for a total of 11 to 14 L (3 to 4 gallons). In all cases, the bottles shall be placed on ice and maintained at 4C. In addition, collect 3, 40-ml VOAs of groundwater from the same well making sure there is no headspace.

Soil Samples

Samples will be collected during drilling of the boring for MWC024. Lithologic information obtained from the drilling of 2 nearby wells EWC002 and IWC001 will be used to target the B-sand and C-sand units in MWC024.

From each of the B- and C-Sands, two (for a total of four) samples will be collected in 3-inch diameter by 12-inch long Shelby tubes. Since the Shelby tubes are 15-inch long, they need to be pre-cut in the shop prior to use in the field. This will provide approximately 20 lbs of soil for the lab studies, as each tube should hold about 5 pounds of soil. Prior to sample collection, the Shelby tubes will be capped on both ends using plastic caps with Teflon liners, and one of the caps will be fitted with two valves to facilitate displacement of atmospheric air and replacement with argon gas. The other end of the Shelby tube will be sealed with laboratory Parafilm. The tube will be purged with Argon prior to collection of the soil sample.

When the target sample depth is reached and the core barrel is removed from the ground, the cap will be removed from the Parafilm-covered end of the tube, and it will be forced into the soil-filled core barrel, piercing the Parafilm and filling the Shelby tube with soil. If necessary, sonic energy will be used to assist insertion of the Shelby tube into the core barrel. The Shelby tube will be removed from the core barrel; 1 to 2 inches of soil at the end of the tube will be quickly removed and replaced with groundwater from well IRZCMW003, collected earlier in the day. The end of the Shelby tube will be sealed with a Teflon-lined plastic cap, wrapped with Parafilm. The tubes will be stored in a cooler(s) on ice and shipped overnight (together with the water samples) to CDM's environmental treatability laboratory in Bellevue, Washington.

Upon arrival at the lab, the cores will be immediately placed in the anaerobic glove box. Approximately 1-2" will be cut from both ends of each tube and will be discarded. The remaining soil will be composited into one sample that represents both the B- and C-sand.